ASSIGNMENT 11

Textbook Assignment: "Electronic Surveying Equipment." Page6 12-1 through 12-8. "Material Testing." Pages 13-1 through 13-28.

Learning Objective: Display a basic familiarity with the electronic distance measurement (EDM) system by identifying related processes and devices.

11-1. In the EDM system, a linear distance can be computed by multiplying the time it takes a flash of light to travel a given distance by the velocity of the light.

1. True
2. False

11-2. Electronic distance meters operate using which of the following methods?

1. Microwaves
2. Light Waves
3. Both 1 and 2 above
4. Refracted light

11-3. Which of the following instruments originates and transmits the signal?

1. Sending
2. Remote
3. Receiver
4. Geodimeter

11-4. What advantage, if any, does the electromagnetic instrument have over the electro-optical instrument?

1. Electromagnetic EDMs do not require an unobstructed line
2. Electromagnetic EDMs can be used in fog or inclement weather
3. Electromagnetic EDMs require only one instrument
4. None

11-5. What instrument, if any, is used with an EDM to measure the direction of the line?

1. A theodolite
2. A transit
3. A direct reading level
4. None

11-6. You have used separate setups for measuring the vertical angle and the distance. Besides the h.i. of the instruments, which of the following data is required to reduce the slope distance?

1. The temperature
2. The target h.i. only
3. The reflector h.i.
4. Both 2 and 3 above

11-7. Which of the following positioning systems utilizes satellites?

1. Initial positioning system
2. Electronic positioning system
3. Doppler positioning system
4. Each of the above

11-8. Which, if any, of the following groups contain data storage units?

1. Computerized theodolite and EDM
2. Combined theodolite and EDM
3. Electronic tachometers
4. None of the above

11-9. What equipment is available to the NMCB as augment equipment for high-order precision surveying?

1. Computerized theodolite
2. Combined theodolite and EDM
3. Doppler system
4. Electronic tachometers

11-10. The laser light beam consists of what number of color(s) of the color spectrum?

1. One
2. Two
3. Three
4. Four

11-11. The single-beam laser does NOT emit a visible light beam and cannot be used for alignment.

1. True
2. False

11-12. A rotating laser level is self-leveling within what range?

1. 20 seconds
2. 8 degrees
3. 16 degrees
4. 90 degrees

11-13. Which of the following advantages applies when using a laser plane?

1. Requires less time to take the same number of rod readings
2. Does not require an instrumentman for shooting a line
3. Uses a laser beam instead of a string line
4. Each of the above

Learning Objective: Recognize the procedures used to perform various soils tests and identify the apparatus and equipment used for each procedure.

11-14. Compaction improves which of the following soil properties?

1. Strength
2. Flexibility
3. Moisture content
4. Cohesiveness

11-15. As the moisture content is increased, the density will also continue to increase.

1. True
2. False

11-16. What effect does an increased compactive effort have on the density and OMC?

1. Increases both the OMC and the density
2. Increases the density and decreases the OMC
3. Increases the OMC and decreases the density
4. Decreases both the OMC and the density

11-17. What is the volume of the Proctor mold?

1. 1 cubic foot
2. 1/3 cubic foot
3. 3 cubic foot
4. 1/30 cubic feet

11-16. The compaction tamper has a drop of what distance?

1. 10 inches
2. 14 inches
3. 18 inches
4. 24 inches

11-19. When you prepare your samples for the compaction test, the moisture content of each sample is increased by what increment?

1. 1%
2. 2%
3. 1 1/2%
4. 2 1/2%

11-20. The objective of the compaction test is to determine what factor?

1. The OMC
2. The maximum density
3. The compactive effort required
4. The soil weight

11-21. During construction, what check is performed to test the compactive effort?

1. Moisture test
2. CBR test
3. Soil compaction test
4. Density test

11-22. When determining in-place density, which of the following methods should you use?

1. Penetration method
2. Load-bearing method
3. Nuclear moisture-density meter method
4. Hydrometer method

11-23. Before you perform the sand-displacement method for in-place density, certain calibration must be performed. Which of the following calibration must be completed?

1. Determine the jar volume
2. Determine the sand density
3. Determine the volume of the cone, template, and surface irregularities
4. Each of the above

11-24. What is the depth of the hole for the sand-displacement method?

1. 5 inches
2. 6 inches
3. 3 inches
4. 4 inches

11-25. A soil-sample container must be kept closed to prevent what problem?

1. Absorption of moisture
2. Sample loss
3. Moisture loss

11-26. What method is recommended to determine the moisture content of a sample?

1. The alcohol burn-off method
2. The Speedy moisture tester method
3. The oven-dried method
4. The air-dried method

11-27. The nuclear moisture-density meter determines the moisture in the soil by what method?

1. Measures the hydrogen concentration in the soil
2. Counts the gamma rays emitted
3. Measures the moisture evaporated by radiation
4. Measures oxygen in the soil

11-28. Before operating the nuclear moisture-density meter, you must receive specialized training and obtain certification.

1. True
2. False

11-29. The California bearing ratio test is what type of test?

1. Density
2. Load bearing
3. Moisture
4. Soil analysis

11-30. Procedures for sample preparation for the CBR test are found in what publication?

1. MIL-STD-621A
2. NAVFAC MO-330
3. ASTM D 422
4. NAVFAC P-437

11-31. Which of the following tools are part of the loading-press assembly?

1. CBR mold
2. Tripod attachment
3. Surcharge weight
4. Soaking tank

11-32. How many successive tests are performed for the CBR test?

1. Five
2. Two
3. Three
4. Four

11-33. The mold and sample must be soaked in water for what minimum number of days?

1. 5
2. 2
3. 3
4. 4

11-34. After you remove the sample from the water, how long should it drain before the penetration test is performed?

1. 15 minutes
2. 2 hours
3. 8 hours
4. 24 hours

11-35. When performing the penetration test, how do you obtain the total load?

1. Multiply the dial reading by the proving-ring constant
2. Divide the unit load by three
3. Multiply the corrected dial reading by the proving-ring constant
4. Multiply the penetration by the standard load

11-36. When determining the CBR values, what penetration value should you normally use?

1. 0.1 inch
2. 0.2 inch
3. 0.3 inch
4. 0.4 inch

11-37. When is soil considered susceptible to frost?

1. When the OMC is greater than 4%
2. When the soil contains 3% or more by weight of particles smaller than 0.020 mm in diameter
3. When the soil contains 3% or more by weight of particles passing a No. 200 sieve
4. When the OMC is between 8% and 12%

11-38. What publication(s) should you refer to for the proper procedures of hydrometer analysis?

1. ASTM D 422
2. NAVFAC MO-330
3. Both 1 and 2 above
4. NAVEDTRA 12540

11-39. Samples for the hydrometer analysis must pass through

1. a No. 10 sieve
2. a No. 50 sieve
3. a No. 100 sieve
4. a No. 200 sieve

11-40. After you make the soil-water slurry, how long should the sample soak?

1. 30 minutes
2. 6 hours
3. 12 hours
4. 16 hours

11-41. Readings taken with the hydrometer require correction due to which of the following factors?

1. Temperature different from the standard
2. The effect of the dispersing agent on the liquid density
3. Difficulty in reading the meniscus
4. Each of the above

Learning Objective: Recognize the types of cement and the tests used to identify them.

11-42. Cement is another name for concrete.

1. True
2. False

11-43. Portland cement is a mixture of clay and limestone of which a certain percentage must pass through a No. 200 sieve?

1. 80%
2. 90%
3. 95%
4. 100%

A.	Type I	E.	Type V
B.	Type II	F.	Type IP
C	Type III	G.	Type IS
D.	Type IV	H.	Air-entrained

Figure 11A

IN ANSWERING QUESTIONS 11-44 THROUGH 11-47, SELECT FROM FIGURE 11A THE TYPE OF CEMENT THAT IS THE CORRECT RESPONSE. ALL INDIVIDUAL RESPONSES MAY NOT BE USED.

11-44. This type of cement is normally used is cold-weather construction.

1. B
2. C
3. D
4. F

11-45. Which of the following types of cement is not available as air entrained?

1. C
2. D
3. F
4. G

11-46. This type of cement is considered all-purpose and is used in ordinary construction.

1. A
2. E
3. G
4. H

11-47. This type of cement produces concrete with less strength than concrete made with portland cement but the workability is better.

1. D
2. E
3. F
4. G

11-48. What type of cement is used to prevent staining or darkening of finished concrete?

1. Waterproofed cement
2. Air-entrained cement
3. Pozzolan cement
4. White cement

11-49. What is the maximum time the hardening test should take to complete?

1. 6 hours
2. 10 hours
3. 16 hours
4. 24 hours

Learning Objective: Identify types of water used in concrete, the impurities found in the water, and the effects the impurities have on the concrete. Identify the types and requirements of aggregate and identify the tests used on the aggregates.

11-50. Which of the following purposes does water serve in the concrete mix?

1. Starts the hydration
2. Changes the hydration process
3. Retards the hydration
4. Reduces workability

11-51. What effect does organic material have on the hydration process?

1. Prevents a full chemical reaction
2. Prevents cement adherence
3. Contributes to concrete deterioration
4. Each of the above

11-52. When seawater is used to mix concrete, what compensation must be made to maintain compressive strength?

1. Increase the water-cement ratio
2. Decrease the water-cement ratio
3. Use Type III cement
4. Use waterproofed cement

11-53. Aggregate should have what shape to increase workability?

1. Rounded
2. Subrounded
3. Subangular
4. Angular

11-54. What is the maximum size a coarse aggregate should be in a heavily reinforced slab, 7 inches thick?

1. 1 inch
2. 2 inches
3. 1 1/2 inches
4. 2 1/2 inches

11-55. To remove silts, clays, and organic material in the aggregate to be used in a concrete mix, which of the following actions should you take?

1. Drying
2. Burning
3. Washing
4. Heating

11-56. What is the recommended amount for the sampling of a stockpile that is used for the tests?

1. The amount needed
2. Twice the amount needed
3. Three times the amount needed
4. Four times the amount needed

11-57. What is the name of the value that gives a relative measure of the proportions of fine and coarse particles in an aggregate?

1. Fineness module
2. Gradation of the sample
3. Aggregate grading
4. Gradation limits

11-58. When you test the aggregate for soundness, what test, other than the freeze-thaw test, may be performed?

1. Fines test
2. Color test
3. Salt test
4. Wash test

11-59. What is the recommended amount of fines in concrete to achieve good workability?

1. 0.0 to 1.0 percent
2. 1.1 to 2.9 percent
3. 3.0 to 5.0 percent
4. Above 5 percent

11-60. When the percentage of fines in a sample is 5 percent and the dry weight is 1,995 grams, what is the original dry weight of the sample?

1. 1,895 grams
2. 2,005 grams
3. 2,095 grams
4. 2,100 grams

11-61. When you test for undesirable lightweight material, what is the size of sieve used for coarse aggregate?

1. 1/4 inch
2. No. 4
3. No. 10
4. No. 50

11-62. When do you perform the test for clay lumps?

1. Before sieve analysis
2. After sieve analysis
3. After washing
4. Both 2 and 3 above

11-63. You have performed the color test and determined that organic material is present in the sand. Which of the following options should be taken?

1. Find a replacement sand
2. Wash the existing sand
3. Use a lower water-cement ratio
4. Each of the above

11-64. When you are determining bulk specific gravity, the aggregate should be in what condition?

1. Oven-dried
2. Air-dried
3. Super-saturated
4. Saturated, surface-dried

11-65. Absorption represents what moisture content of the aggregate?

1. The surface moisture
2. The aggregate at SSD
3. The aggregate super-saturated
4. The quantity of water required for the mix

11-66. What is the recommended length of time to soak your sample for the specific gravity test?

1. 6 hours
2. 12 hours
3. 18 hours
4. 24 hours

11-67. What procedure assists you in determining when fine aggregate has reached SSD?

1. The wet shaking test
2. The water-absorption cone and tamper method
3. The pycnometer
4. The Atterberg limits test

11-68. The oven-dried fines sample weighed 485 grams. What was the percentage of absorption?

1. 1.5%
2. 2.0%
3. 2.5%
4. 3.0%

Learning Objective: Identify admixtures used for concrete and the effects they have on concrete characteristics.

11-69. What results are obtained by adding accelerators to concrete?

1. Higher rate of heat production
2. Slows the hydration process
3. High-early-strength concrete with a lower strength
4. Full hydration does not occur

11-70. The workability of concrete is governed by the amount of aggregate in the mix. When the aggregate cannot be reduced, what admixture should you use?

1. Calcium chloride
2. Fly ash
3. Pozzolan
4. Each of the above

11-71. Dense concrete is required in what type of concrete work?

1. Prestressed structures
2. Overhead pours
3. Load-bearing walls
4. Runways

11-72. The critical period in the curing process of concrete occurs at what time frame?

1. From the day of placement through the 10th day
2. From the day after placement through the 10th day
3. From the day of placement through the 14th day
4. From the day of placement through the 28th day

11-73. What is the ideal temperature ranges for concrete work?

1. Below 35°
2. Between 35° and 50°
3. Between 55° and 70°
4. Between 70° and 90°

11-74. After the initial set is attained, which of the following actions may be taken to keep the hydration process in action?

1. Apply a curing compound
2. Cover the concrete with burlap or plastic
3. Keep the forms wet
4. Apply water directly to the surface

11-75. In concrete work, any loss of moisture during the curing process by seepage or evaporation prevents complete hydration and the development of optimum strength, as well as watertightness.

1. True
2. False